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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,869	06/29/2001	Li-Chun Wang	2685/5860	6553

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EXAMINER

NGUYEN, DUC M

ART UNIT	PAPER NUMBER
2685	11

DATE MAILED: 03/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,869

Applicant(s)

WANG, LI-CHUN

Examiner

Duc M. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 05 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Applicant's response filed on 11/5/03. Claims 16-33 are now pending in the present application.

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 6/24/03 have been disapproved because they introduce new matter into the drawings. 37 CFR 1.121(a)(6) states that no amendment may introduce new matter into the disclosure of an application. The original disclosure does not support the showing of 1.5 R.

Specification

2. The amendment filed 6/24/03 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: "cell(s) are separated from one another by a distance of 1.5 R. These distances are clearly defined by the hexagonal geometry depicted therein".

Here, the distance 1.5 R is not supported by the original disclosure. Further, the statement that "These distances are clearly defined by the hexagonal geometry depicted therein" is not found persuasive because according to US 5,365,571 to Rha et al which states that "In real system, the distance D and the radius R would differ for different cells" and that "the distance D and the radius R are basic system design

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factors that affect the signal-to-interference ratio for co-channels" (see Fig. 3 and col. 3, lines 16-24). Therefore, it is believed that the hexagonal geometry depicted in Figure 10 is simply for illustration purpose, and that it was not intended for being used to calculate the separate distance D from the radius R of the cell.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims **24-27** are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. .

Claim 24 recites the limitation of "base stations that are separated from one another by a distance of **1.5 R**". Since the amended specification is not entered for the reason as set forth above, the limitation of "**1.5 R**" *presents new subject matter situations* and was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims **16-17, 19-23, 28-29, 30-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Schaeffer** (US Pat No. **5,073,971**) in view of **Rha et al** (US Pat No. **5,365,571**).

Regarding claim **16**, **Schaeffer** discloses a frequency reuse method for a cluster of 4 cells repeat pattern wherein a frequency reuse factor of 2 or each frequency is used twice in a cluster of four cells (see **Fig. 4, col. 3, line 51-54**), which differs from the claimed limitation in that 6-sector cells are used rather than 3-sector cells as claimed. However, **Rha** discloses prior arts using either a 3-sectors cell or a 6-sectors cell for the same cell layout in a cluster of four cells (N=4, see **Figs. 1, 2A and col. 2, line 58 - col. 3, line 46**). Since the use of a 3-sector cell would reduce the number of frequency allocations, and since the number of frequency allocations is subjected to the spectrum limit imposed by FCC regulations, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the above teachings of **Schaeffer** to

Rha, for incorporating the above 4 cells repeat pattern into 3-sector cells as well, for utilizing advantages provided by 3-sector cells such as cost or bandwidth reduction (i.e., there is a limited number of frequencies available for use).

Regarding claim **17**, the claim is rejected for the same reason as set forth in claim **20** above. In addition, **Schaeffer** discloses each cell in the cluster is assigned a group of frequency sets that is unique within the cluster (see **Schaeffer**, Fig. 4).

Regarding claim **19**, it is rejected for the same reason as set forth in claim **16** above. In addition, **Schaeffer** discloses a frequency reuse factor of 2 is used (see **Schaeffer**, col. 3, line 51-54).

Regarding claim **20**, it is rejected for the same reason as set forth in claim **16** above. In addition, since **Schaeffer** as modified would disclose the same frequency reuse factor of 2 is used in 3-sectors cells, and since it is clear to one skill in the art that for any frequency reuse factor K , the number of frequencies required for 3-sector cells would be half of the number of frequencies required for 6-sector cells because the number of sectors for 3-sector cells is half of the number of sectors of 6-sector cells. Therefore, **Schaeffer** as modified would disclose six channel sets as claimed, in order to have a 4 tri-cells repeat pattern with each frequency used twice in a cluster of 4 cells (see **Schaeffer**, col. 3, lines 51-54, noting that 12 channels divided by 2 would be equal 6 channels).

Regarding claim **21**, the claim is interpreted and rejected for the same reason as set forth in claim **20** above.

Regarding claim **22**, the claim is rejected for the same reason as set forth in claim **17** above.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim **20** above. In addition, it is clear that **Schaeffer** would disclose the frequency resources are allocated to provide at least one other sector between the two sectors that share a frequency set (see **Schaeffer**, Fig. 4).

Regarding claims **28-29**, the claims are interpreted and rejected for the same reason as set forth in claim **19** above.

Regarding claims **30-32**, the claims are interpreted and rejected for the same reason as set forth in claim **20** above.

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim **20** above. In addition, it is clear that **Schaeffer** would disclose two sectors having the same assigned frequency set are separated by a third sector having a different assigned frequency set (see **Schaeffer**, Fig. 4).

5. Claim **18** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Schaeffer** in view of **Rha** and further in view of **Brodie** (PCT Pub. No. **WO 9634505**).

Regarding claim **18**, **Schaeffer** as modified would disclose all the claimed limitations, see claim **16** above, except for directional antennas having beamwidths of 50 to 70 degrees. However, **Brodie** discloses a frequency reuse method for 3-sector cells wherein the antennas have a beamwidth of 50 to 70 degrees rather than 120 degrees (see Fig. 2 and page 3, lines 15-16). Therefore, it would have been obvious to

one of ordinary skill in the art at the time the invention was made to provide the above teaching of **Brodie** to **Rha** and **Schaeffer** for using antennas with narrow beamwidths as claimed, for reducing channel interferences.

6. Claims **16-23, 28-29, 30-33** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Schaeffer** (US Pat No. **5,073,971**) in view of **Brodie** (PCT Pub. No. **WO 9634505**).

Regarding claim **16**, **Schaeffer** discloses a frequency reuse method for a cluster of 4 cells repeat pattern wherein a frequency reuse factor of 2 or each frequency is used twice in a cluster of four cells (see **Fig. 4, col. 3, line 51-54**), which differs from the claimed limitation in that 6-sector cells are used rather than 3-sector cells as claimed. However, **Brodie** discloses a frequency reuse method for 3-sector cells (see **Fig. 2** and **page 3, lines 15-16**). Since the use of a 3-sector cell would reduce the number of frequency allocations, and since the number of frequency allocations is subjected to the spectrum limit imposed by FCC regulations, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the above teachings of **Schaeffer** to **Brodie**, for incorporating the above 4 cells repeat pattern into 3-sector cells as well, for utilizing advantages provided by 3-sector cells such as cost or bandwidth reduction (i.e, there is a limited number of frequencies available for use).

Regarding claim **17**, the claim is rejected for the same reason as set forth in claim **16** above. In addition, **Schaeffer** discloses each cell in the cluster is assigned a group of frequency sets that is unique within the cluster (see **Schaeffer, Fig. 4**).

Regarding claim **18**, the claim is rejected for the same reason as set forth in claim **16** above. In addition, **Schaeffer** as modified would disclose directional antennas having beamwidths of 50 to 70 degrees as claimed (see **Brodie**, Fig. 2 and page 3, lines 15-16).

Regarding claim **19**, it is rejected for the same reason as set forth in claim **16** above. In addition, **Schaeffer** discloses a frequency reuse factor of 2 is used (see **Schaeffer**, col. 3, line 51-54).

Regarding claim **20**, it is rejected for the same reason as set forth in claim **16** above. In addition, since **Schaeffer** as modified would disclose the same frequency reuse factor of 2 is used in 3-sectors cells, and since it is clear to one skill in the art that for any frequency reuse factor K , the number of frequencies required for 3-sector cells would be half of the number of frequencies required for 6-sector cells because the number of sectors for 3-sector cells is half of the number of sectors of 6-sector cells. Therefore, **Schaeffer** as modified would disclose six channel sets as claimed, in order to have a 4 tri-cells repeat pattern with each frequency used twice in a cluster of 4 cells (see **Schaeffer**, col. 3, lines 51-54, noting that 12 channels divided by 2 would be equal 6 channels).

Regarding claim **21**, the claim is interpreted and rejected for the same reason as set forth in claim **20** above.

Regarding claim **22**, the claim is rejected for the same reason as set forth in claim **17** above.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim **20** above. In addition, it is clear that **Schaeffer** would disclose the frequency resources are allocated to provide at least one other sector between the two sectors that share a frequency set (see **Schaeffer**, Fig. 4).

Regarding claims **28-29**, the claims are interpreted and rejected for the same reason as set forth in claim **19** above.

Regarding claims **30-32**, the claims are interpreted and rejected for the same reason as set forth in claim **20** above.

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim **20** above. In addition, it is clear that **Schaeffer** would disclose two sectors having the same assigned frequency set are separated by a third sector having a different assigned frequency set (see **Schaeffer**, Fig. 4).

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321[®] may be used to overcome an actual or provisional rejection based on a non-statutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims **16-23, 30-33** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. **6,002,935**. Although the conflicting claims are not identical, they are not patentably distinct from each other because they are both directed to a frequency reuse method in a communications system wherein each frequency is used 2 times in a cluster of 4 tri-cells repeat pattern.

Response to Arguments

8. Applicant's arguments filed 11/5/03 have been fully considered but they are not persuasive.

As to Applicant's regarding the separate distance D of $1.5 R$, it is noted that, the distance $1.5 R$ is not supported by the original disclosure. Further, the statement that "These distances are clearly defined by the hexagonal geometry depicted therein" is not found persuasive because according to US **5,365,571** to Rha et al which states that "In real system, the distance D and the radius R would differ for different cells", and that "the distance D and the radius R are basic system design factors that affect the signal-to-interference ratio for co-channels" (see **Fig. 3** and **col. 3, lines 16-24**). Therefore, it is believed that the hexagonal geometry depicted in Figure 10 is simply for illustration

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purpose, and that it was not intended for being used to calculate the separate distance D from the radius R of the cell.

As to Applicant's regarding the separate distance and the re-use distance, it is noted that these distances are correlated features (i.e, the re-use distance is a function of the separate distance). Therefore, the argument on the variation of these distances would apply equally well to either one of these distances. For more information on the variation of the reuse distance feature, Applicant's attention is directed to papers written by Wang, "A new cellular architecture based on an interleaved cluster concept", IEEE Trans. On Vehicular Technology, Vol. 48, No. 6, Nov. 1999, and Nguyen et al, "Channel Alteration and Rotation in Narrow Beam TriSector Cellular System", (see Fig. 9 regarding the *reuse distance of 1.5 R*).

Therefore, the examiner believes that the rejection of 35 USC 112, 1st paragraph to claims 24-27 still proper.

As to claims 16, 30, in response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, since there is some teaching, suggestion, or motivation to do so found in the references themselves (frequency reuse method for a cluster of 4 cells repeat pattern wherein a

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frequency reuse factor of 2 or each frequency is used twice in a cluster of four cells by **Schaffer**, and frequency reuse method for 3-sector cells by **Rha**), and in the knowledge generally available to one of ordinary skill in the art (the use of a 3-sector cell would reduce the number of frequency allocations, and that the number of frequency allocations is subjected to the spectrum limit imposed by FCC regulations), it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the above teachings of **Schaeffer** to **Rha**, for incorporating the above 4 cells repeat pattern into 3-sector cells as well, for utilizing advantages provided by 3-sector cells such as cost or bandwidth reduction (i.e, there is a limited number of frequencies available for use).

As to Applicant's argument regarding the narrow 60 degree beamwidths in 3-sector cells, Applicant's direction is directed to the rejection of claim 18, wherein this feature is taught by Brodie.

As to claims 28-29, Applicant's arguments are moot in view of the new ground(s) of rejection. Also note for the double rejection of claims 16-23, 30-33 in this Office Action (see paragraph 6 above).

For foregoing reasons, the examiner believes that the pending claims are not allowable over the cited prior art.

Conclusion

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for formal communications intended for entry)

(for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington VA, Sixth Floor (Receptionist).

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (703) 306-4531, Monday-Thursday (9:00 AM - 5:00 PM). Or to Edward Urban (Supervisor) whose telephone number is (703) 305-4385.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-4700.

Duc Nguyen

Mar 10, 2004

A handwritten signature in black ink, appearing to read 'Duc Nguyen', written over a horizontal line.